Interim Policy	***Rev. Date July 28, 1997***

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NORTHWEST REGION TRAFFIC OPERATIONS

CROSSWALKS: POLICY AND PRACTICE

Overview

Marked crosswalks serve to guide pedestrians in the proper path. Marked crosswalks should not be considered as safety devices. Studies have shown that more pedestrian accidents occur at marked crosswalks than at unmarked crosswalks. Pedestrians tend to develop a false sense of security when using marked crosswalks. On the other hand, pedestrians seem to exercise more caution when crossing a roadway where crosswalks are not marked. In keeping with the philosophy that marked crosswalks are an aid for directing pedestrians rather than as a safety device, the State normally will install marked crosswalks only at controlled (signalized or stop controlled) intersections, which have significant pedestrian volume.

The Northwest Region's Traffic Operations Group has assembled this guideline as an aid for its staff to use when assessing the need for installing a marked crosswalk at a specific location.

The guideline is divided into the following sections:

Section A - Warrants for a generic crosswalk installation

Section B - Warrants for a crosswalk installation within an incorporated city or town

Section C - Warrants for a school crosswalk

Section D - Crosswalk installation

Pertinent Laws and Guidelines:

The reader is also referred to the following laws and guidelines for additional information

RCW 46.61.235 -

Requires motorists to stop for pedestrians in either marked crosswalks or unmarked crosswalks at intersections.

RCW 46.61.240 -

Discusses the responsibility of pedestrians when they cross a road at other than a marked crosswalk or unmarked crosswalk at an intersection.

RCW 46.61.570 -

Requires that a distance of twenty feet each side of the crosswalk shall be clear of any obstruction.

MUTCD 3B-18 -

Crosswalks and crosswalk lines.

MUTCD 4C-5-

Signal Warrant 3, Minimum Pedestrian Volume

100 pedestrians or more for each of any four hour period; or

190 pedestrians or more during any one hour period

Volume may be reduced by 50 percent if predominate pedestrian speed in below 3.5 feet per second

Less than 60 gaps per hour

Suggest curbside parking be prohibited 100 feet in advance and 20 feet beyond crosswalk

Section A -

Warrants for a generic crosswalk installation

The Northwest Region (NWR) generally installs crosswalks only at controlled intersections. Controlled intersections are defined as signalized controlled or stop sign controlled. The NWR will not install crosswalks at "free right turn" areas or at mid-block locations, unless an engineering study supports such a decision. The engineering study would include accident evaluation, pedestrian demand, roadway conditions, direct route, consideration of alternate route, etc.

The standard number of crosswalks for a "T" intersection should be three. The

standard number of crosswalks for a "Four Legged" intersection should be four. At signalized crosswalks this will include all necessary displays and detection systems. The minimum number of striped crosswalks, including displays and detection, at signalized intersections, is two for "T" intersection and three for "Four Legged" intersections. (Pedestrian crossing prohibition signs shall be installed on the legs that are not marked.) Typically, for a "T" intersection, the crosswalk should be installed across the mainline leg that receives right turning traffic from the stem of the "T." Any leg controlled by a stop sign is an acceptable location for a crosswalk; however, they are typically not striped with a crosswalk unless there is a significant pedestrian activity in the area.

If a crosswalk is requested at an uncontrolled location, the following criteria will have to be satisfied before the crosswalk location can be approved.

A-1. A crosswalk ***may*** be installed if all of the following conditions are met:

- The operating speed limit on the highway is 45 mph or lower. Marked crosswalks should not typically be used at remote locations where the operating speed exceeds 35 mph and is not located at a controlled intersection. Note: Placement of crosswalks will be predicated upon the operating speed of a highway. The operating speed is also known as the 85 percentile speed. If the operating speed is not known, then the posted speed may be used.
- There is adequate stopping sight distance as defined by Tables III-1 and III-2 in the AASHTO green book.
- There is adequate illumination or the potential to install it. Illumination of marked crosswalks is normally provided when pedestrian volumes meet the criteria in MUTCD Section 4C-5. When markings are requested by others and volumes do not meet those requirements, funding and power for crosswalk lighting is normally provided by the requester.
- The volume criteria in Item A-2 is met, and either
- The criteria listed in Item A-3 for roadway conditions
  or
- The criteria listed in A-4 for a non-stop controlled right turn lane is met.

A-2. Pedestrian/Vehicle Volume Criteria:

- The hourly pedestrian volume warrant shall be met for any four hour period of a typically Monday through Friday weekday.
- The conditions which lead to the pedestrian volumes being present shall be in effect for at least six months of the year.
- Vehicle volumes are abased on Annual Average Daily Traffic.

A-3. Roadway Conditions:

- A pedestrian shall be forced to cross only two lanes of traffic before being even a refuge, i.e., crossings of three lanes of traffic in the same direction is not allowed. Left, Right, andTWLT lanes are each considered as a lane of traffic.

- The refuge, normally in the median area, shall be an ADA compatible raised island. This may result in an island being split by an at-grade crossing path.

- Shoulder (or sidewalk/curb) bulbs to decrease the crossing distance may be considered as an option for decreasing the roadway width that a pedestrian has to cross.

- There is overhead, internally illuminated signing supported by standard approach signing.

- Spacing minimums to the closest nearby crossing opportunity are met. A crossing opportunity is defined to be a signalized crossing or an all-way stop controlled intersection. Minimum spacing is defined to be no closer than 600' in a rural setting and 300' in an urban setting.

A-4. Non-stop controlled right turn lane criteria:

- The turn lane shall depart from the through lane by a maximum 20° taper, with as tight a radius as possible on the entry to cross street.
- There shall be a clear line of sight from the vehicle to a pedestrian standing on a sidewalk, walkway or shoulder area at the inside of the curve. The line of sight distance should meet theMUTCD stopping sight distance criteria.
- The turn lane shall be required to meet the pedestrian/vehicle volume criteria as listed in A-2.

Section B -

Warrants For A Crosswalk Installation Within An Incorporated City or Town

Incorporated cities or towns having a population of 22,500 or more are responsible for the highway striping and pavement markings within their jurisdictions.

For cities or towns having a population of 22,500 or less, the state is responsible for the highway striping and pavement markings within their jurisdictions.

B-1. The NWR may install and maintain crosswalks within a particular incorporated city or town (under 22,500) using that agency's crosswalk standards, if the local agency has a crosswalk policy that is in conformance to theMUTCD and is in general agreement with ours. The local agency should submit a written request to us along with an ordinance and/or its engineering crosswalk standard.

a. Marked crosswalks at non-controlled intersections must still meet the criteria listed in Item A-1.
b. The city may maintain the crosswalk striping, if it wishes and the agreement is in writing such as under theNWR - Traffic Operation Group's Striping Memorandum of Understanding. However, the State will not reimburse the city for any striping costs incurred by the city.

B-2. Where the warrants may be marginally met, the state may agree to install a marked crosswalk, if the local agency agrees that the marked crosswalk shall be removed if more pedestrian accidents occur after installation than before. The

statistical comparison will be made on the basis of pedestrian accidents (and/or pedestrian accident rate per million vehicles) entering the crosswalk per year. The nominal before/after comparison should be at least one year in length.

B-3. The State will mark the crosswalk and install the appropriate shoulder mounted pedestrian signs per the Manual on Uniform Traffic Control Devices (MUTCD). Maintenance of these traffic control devices shall be the State's responsibility. Any supplemental signs or devices (such as flashers) may be installed by the city or town, if

approved by the State. Any and all costs for said supplemental signs or devices shall be the responsibility of the city or town.

B-4. In 1995, the NWR initiated a policy of not restriping crosswalks at non-controlled locations. Prior to 1995, the NWR did install several marked crosswalks at non-controlled locations. The NWR also accepted the responsibility of maintaining marked crosswalks at non-controlled locations through "route jurisdiction transfer." The NWR has felt that it would be inappropriate to continue this practice since it does not follow our basic guideline philosophy.

However, if an incorporated city or town (under 22,500) makes a formal request to continue the maintenance of a marked crosswalk at a non-controlled location and submits a crosswalk ordinance, the NWR may continue to maintain the crosswalk, provided that no pedestrians related accidents have occurred at the crosswalk location for the last three years. Continuation of the crosswalk maintenance would be contingent upon no pedestrian related accidents occurring at that crosswalk.

Section C - Warrants For A School Crosswalk

A marked crosswalk may be installed on a State highway if:

C-1. The crossing is on an established school route (approved school route plan).

C-2. The school district agrees to station a crossing guard at the crosswalk when it is being used by students.

C-3. The local enforcement agency commits to enforcing the school speed limit of 20 mph.

The State will be responsible for the design, installation, operation, and maintenance of all signs, pavement markings, and control equipment, exclusive of any overhead sign and flashing lights which would be the responsibility of the school district.

Section D - Crosswalk Installation

For added visibility the region's policy is to use a series of longitudinal (parallel) lines rather than the standard two transverse (perpendicular) lines. The longitudinal line layout that we are currently using is known as the "Non-symmetrical Piano

Key" layout. Some people have referred to this layout as the "offset Ladder." The non-symmetrical layout will allow us to keep the crosswalk markings outside of the wheel tracks, thereby increasing the service life of the markings. White is the only color used for marking crosswalks.

The preferred line width should be 24 inches. View the Crosswalk striping detail or download the English Standard Plan H-5c dated 06/24/02). This line width will accommodate a 14 ft. wide lane width per the amended MUTCD. The layout is essentially the same as the 8 inch non-symmetrical piano key layout that we have been using up to this point. The existing 8 inch pattern can be rehabilitated by filling in the eight gap between the two 8 inch lines to make a 24 inch width line.

A 12 inch line width may be used under certain circumstances see detail dated 7/27/98. The 12 inch line width will only accommodate lane widths up to 12 feet wide per the amended MUTCD. The 12 inch width will not allow us to rehabilitate existing 8 inch width layouts and should only be used if the intersections' legs were already done using a 12 inch pattern.

- A mid-block crosswalk ***must*** use the 24 inch width pattern.
- The preferred crosswalk striping material is methylmethacrylate (MMA). We are now able to specify MMA material as the material of choice, since it is not considered a "sole source" or Proprietary" item anymore. The service life of MMA is normally around 5-to-7 years.
  Thermoplastic may be considered only as second choice if there is justification for not using MMA. The service life of thermoplastic between 2-to-3 years.
  Solvent base paint is not normally used for painting crosswalks as its service life is usually less than one year. Solvent based paint may be used only if the crosswalk area was going to be revised with one year or less due to an overlay project, widening project, etc.
- The NWR Pavement Marking Group refreshes crosswalk striping on a 2-to-5 year cycle depending the type of striping material used and the amount of traffic wear encountered. Crosswalks are normally refreshed only if 50 percent or more of its lines have been worn off.
- An 18 inch wide stop bar will always be used in conjunction with marked crosswalks at intersections. The stop bar is normally set four feet back from the crosswalk. No stop bar will be used at any mid-block crossings.

This interim guideline was OK'd for release by Dave McCormick (NWR Traffic Engineer) on July 28, 1997. The final version of

the guideline is currently under review for approval.

Approved By:	_____	_____
	NWR - Traffic Engineer Date	Date